

CLAIMS

I claim:

1. A kitchen appliance with a safety interlock for processing foodstuff comprising:
 - a housing including a drive shaft extending therefrom, the drive shaft being rotatable about a drive axis, at least one portion of the drive shaft being movable along the drive axis between an extended position and a retracted position;
 - a switch supported within the housing;
 - a bowl including a mouth, the bowl being removably mountable to the housing, the drive shaft extending into the bowl when the bowl is secured to the housing in a working position;
- 10 and
 - a bowl lid removably mountable over the mouth of the bowl, the bowl lid being in a working position when mounted over the bowl, a lid shaft being mounted on the bowl lid, the lid shaft being in an operative relationship with the drive shaft when the bowl and bowl lid are in the working position, the lid shaft urging the at least one portion of the drive shaft into the retracted position when the lid shaft is in the operative position, the at least one portion of the drive shaft closing the switch in the retracted position such that power is able to be provided to the kitchen appliance.
2. The kitchen appliance of claim 1 further comprising:
 - a feed tube extending from a top bowl lid wall, the feed tube defining a feed cavity and including a feed mouth, the lid shaft being movably mounted to the feed tube, the lid shaft being movable along the drive axis between the operative position and a safety position.
- 20 3. The kitchen appliance of claim 2 further comprising:
 - a feed tube lid removably mountable to the feed mouth and including a tab, the feed tube lid covering at least a portion of the feed mouth in a closed position, the tab contacting and moving the lid shaft to its operative position when the feed tube lid is in the closed position.
- 25 4. The kitchen appliance of claim 3 wherein the feed tube lid is pivotable relative to the feed tube between the closed position and a loading position, the feed tube lid being secured to the feed tube in the closed position by at least a feed tube latch, the feed cavity being exposed when the feed tube lid is in the loading position.
- 30 5. The kitchen appliance of claim 4 further comprising:

a motor mounted within the housing, the drive shaft including a hollow drive sleeve and a drive pin, the drive pin being movable along the drive axis between the retracted and extended positions, the drive pin being biased toward the extended position and the lid shaft being biased toward the safety position, the tab contacting the lid shaft when the feed tube lid is in the closed position, the lid shaft contacting the drive pin when the lid shaft is in the operative position.

5 6. The kitchen appliance of claim 1 wherein the drive shaft includes a hollow drive sleeve and a drive pin, the drive pin being movably mounted within the hollow drive sleeve, the drive pin being movable between the extended and retracted positions, the drive pin being spring biased toward the extended position.

10 7. The kitchen appliance of claim 6 further comprising:

 a motor mounted within the housing; and

 a switch arm mounted to an end of the drive pin adjacent the housing, the switch arm closing the switch when the drive pin is in the retracted position such that power can be provided to the motor.

15 8. The kitchen appliance of claim 7 wherein the switch arm is mounted to the end of the drive pin such that the switch arm moves along the drive axis when the drive pin moves along the drive axis between the retracted and extended positions, the switch arm being rotationally isolated from the drive pin.

9. The kitchen appliance of claim 6 further comprising:

20 a tool removably mountable to the hollow drive sleeve.

10. The kitchen appliance of claim 9 further comprising:

 a motor mounted within the housing, the tool being rotatably driven by the hollow drive sleeve, the hollow drive sleeve being driven by the drive pin, the drive pin being driven by a gear reduction mechanism, the gear reduction mechanism being driven by a motor shaft of the motor.

25 11. A kitchen appliance with a safety interlock for processing foodstuff comprising:
 a housing including a motor therein, the motor including a motor shaft that rotatably drives a drive shaft, the drive shaft extending from the housing along a drive axis, a drive pin comprising at least a portion of the drive shaft, the drive pin being movable along the drive axis between a retracted position and an extended position;

30 a switch positioned in the housing, the switch being in an operative relationship with the motor;

a bowl including a mouth, the bowl being removably mountable to the housing such that the drive shaft extends into the bowl in a working position;

a bowl lid removably mountable over the mouth of the bowl when the bowl is in the working position, the bowl lid including a feed tube with a feed mouth, the feed tube extending from 5 a top bowl lid wall, a lid shaft being movably mounted to the feed tube, the lid shaft being movable between an operative position and a safety position; and

10 a feed tube lid movably mounted to the feed tube adjacent the feed mouth, the feed tube lid including a tab extending therefrom, the feed tube lid covering at least a portion of the feed tube mouth in a closed position, the tab urging the lid shaft into an operative position and the lid shaft urging the drive pin into the retracted position to close the switch and enable electric power to flow to the motor when the feed tube lid is in the closed position and the bowl and bowl lid are in the working position.

12. The kitchen appliance of claim 11 further comprising:

lid grooves associated with the bowl lid; and

15 lid ribs associated with the bowl, the lid grooves and lid ribs removably mounting the bowl lid to the bowl in the working position in a bayonet-type locking arrangement, the lid grooves and lid ribs extending along the bowl lid and bowl at an engagement angle greater than ten degrees.

13. The kitchen appliance of claim 12 wherein the engagement angle is between fifteen and thirty degrees.

20 14. The kitchen appliance of claim 11 wherein the feed tube lid includes a lid skirt, the lid skirt extending below the mouth of the feed tube when the feed tube lid is in the closed position.

15. A safety interlock for a kitchen appliance that renders the kitchen appliance inoperative when the safety interlock is in an open position, the safety interlock comprising:

25 an electric motor mounted within a housing of the kitchen appliance; a switch mounted within the housing, power being able to be provided to the motor when the switch is closed;

30 a drive shaft driven by the motor and extending from the housing along a drive axis, the drive shaft including a drive sleeve and a drive pin, the drive pin being movably mounted to the drive sleeve, the drive pin being movable along the drive axis between an extended position and a retracted position, the switch being closed when the drive pin is in the retracted position;

a bowl removably mountable to the housing; and

a bowl lid removably mountable over a mouth of the bowl, the bowl lid including a lid shaft, the lid shaft contacting the drive pin and moving the drive pin to the retracted position when the lid shaft is in an operative position and the bowl and bowl lid are in a working position.

16. The safety interlock of claim 15 further comprising:

5 a feed tube extending from the bowl lid, the lid shaft movably mounted to the feed tube, the lid shaft being movable between the operative position and a safety position, the drive pin being biased to the extended position and the lid shaft being biased to the safety position.

17. The safety interlock of claim 16 further comprising:

10 a switch arm mounted to the drive pin adjacent the housing; and
a drive spring biasing the drive pin to the extended position, the drive spring being mounted in the housing between the electric motor and the switch arm.

18. The safety interlock of claim 16 further comprising:

a lid spring biasing the lid shaft toward the safety position, the lid spring being mounted between the bowl lid and the lid shaft

15 19. The safety interlock of claim 15 further comprising:

a tool removably mountable to the drive shaft, the drive shaft driving the tool for processing foodstuff; and

20 a switch arm mounted to the drive pin within the housing, the switch arm moving with the drive pin when the drive pin moves between the retracted and extended positions, the switch arm being rotatably isolated from the drive pin.

20. The safety interlock of claim 19 wherein the switch arm includes a central ring that is mounted to the drive pin and an arm protrusion that extends radially outwardly from the central ring, the arm protrusion contacting and closing the switch when the drive pin is in the retracted position.

25 21. The safety interlock of claim 20 wherein the housing includes a retaining channel adjacent the switch arm, the arm protrusion extending into and being movable generally parallel to the drive axis within the retaining channel, the retaining channel blocking the switch arm from rotating relative to the housing when the drive shaft rotates.

30 22. The safety interlock of claim 21 wherein the switch arm is movable along the drive axis with the drive pin between the retracted and extended positions, the switch arm being movable within the retaining channel.

23. The safety interlock of claim 15 further comprising:

a tool removably mountable to the drive shaft, the drive sleeve being hollow and the drive pin being movably mounted within the drive sleeve, the drive sleeve including tool coupling teeth on an outside surface, the drive pin including drive shaft coupling teeth on an upper peripheral surface, the tool coupling teeth rotatably coupling the tool to the drive sleeve and the drive shaft

5 coupling teeth rotatably coupling the drive pin to the drive sleeve.

24. A kitchen appliance with a safety interlock for processing foodstuff comprising:
a housing;

a motor mounted within the housing, the motor including a drive shaft that extends out of the housing, at least one portion of the drive shaft being movable along a drive axis;

10 a switch mounted in the housing;

a bowl removably mountable to the housing such that the drive shaft extends into the bowl in a working position; and

15 a lid removably mountable over a mouth of the bowl, one of the lid and bowl actuating the at least one portion of the drive shaft to close the switch such that power is able to be provided to the motor when the bowl is in the working position and the lid is mounted over the bowl.